

Applicant: Helmut KNOEDL et al.
Docket No. R.306169
Preliminary Amdt.

AMENDMENTS TO THE SPECIFICATION:

Page 1, please add the following new paragraphs before paragraph [0001]:

- [0000.2] CROSS-REFERENCE TO RELATED APPLICATIONS
- [0000.4] This application is a 35 USC 371 application of PCT/DE 2004/000957 filed on May 7, 2004.
- [0000.6] BACKGROUND OF THE INVENTION
- [0000.8] Field of the Invention

Please replace paragraph [0003] with the following amended paragraph:

[0003] Particle filters are used particularly in conjunction with diesel engines, so that as soot filters they can reduce the unwanted expulsion of soot. Particle filters of the type defined at the outset are known for instance from German Patent Disclosure DE 101 28 938 A1, which in terms of the construction and mode of operation of a particle filter is expressly incorporated herein by reference here. However, the use of particle filters has not gained wide use, since they are not unproblematic in practice, particularly in terms of their storage capacity.

Please replace paragraph [0004] with the following amended paragraph:

[0004] For some time, particle filters with an increased storage capacity have been tested; they have filter bodies with filter walls of a sintered metal. In them, metal fibers or grains are sintered together with a metal substrate mat to make filter plates. Various filter designs can be made from the plates. In particular, the filter plates can be used as filter walls for the filter body. As they flow through the filter walls, the soot particles are deposited onto their the wall surface.

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Page 2, please replace paragraph [0005] with the following amended paragraph:

[0005] In a particular model of sintered metal filters,[[.]] The the filter body includes a plurality of filter walls, which, originating at a longitudinal axis of the particle filter, extend substantially in the radial direction and in the direction of the longitudinal axis, and which filter walls are spaced apart from one another in the circumferential direction. Two adjacent filter walls each form a so-called filter pocket. The filter body is secured to a securing element, which in turn is secured to the housing of the particle filter, so that via the securing element, the filter body is positioned in the housing and secured in it. The filter walls are soldered or welded to the securing element, at least in some regions, at least on their face end oriented in the axial direction.

Page 3, please replace paragraph [0008] with the following amended paragraph:

[0008] The object of the present invention is to design and further improve a particle filter excessive of the type defined at the outset such that during the regeneration of the filter, stresses do not arise in the filter, and damage or even destruction of the weld seams or soldered connections between the filter walls and the securing element does not occur.

Please replace paragraph [0010] with the following amended paragraph:

[0010] Advantages of the Invention

SUMMARY AND ADVANTAGES OF THE INVENTION

Please replace paragraph [0011] with the following amended paragraph:

[0011] In the particle filter of the invention, the filter pockets or filter walls, and the securing element to which they are secured, can expand virtually unhindered. This is especially

important in the regeneration of the particle filter, since temperature differences inside the filter and, because of the high temperatures, a major thermal expansion of the filter pockets and the securing element can occur then. According to the invention, decoupling of the regions of the securing element that are joined to the filter pockets and of the regions of the securing element that are secured to the housing of the particle filter is attained by ~~means~~ use of [[the]] compensation means. As a result, the regions of the securing element that are joined to the filter pockets are not hindered from expanding as needed with the filter pockets. As a result, the weld seams can expand virtually unhindered in the radial direction, and no stresses occur in the weld seams or soldered connections between the filter walls and the securing element. Stress fractures are thus prevented. Hence according to the invention, the filter pockets are not welded directly to the part of the securing element that is secured to the housing, but indirectly via the compensation means.

Page 4, please replace paragraph [0013] with the following amended paragraph:

[0013] In an advantageous refinement of the present invention, however, it is proposed that the compensation means are an integral component of the securing element. The compensation means may be embodied as a component that is formed separate from the securing element and [[is]] then integrated with the securing element. However, it is also conceivable for the compensation means to be embodied in one piece with the securing element.

Page 5, please replace paragraph [0017] with the following amended paragraph:

[0017] In another advantageous refinement of the present invention, it is proposed that in the region of the compensation means, the securing element has a web of material that is folded at least once. In the region of the compensation means, a sheet or web of material with a plurality of web portions spaced apart from one another and located one above the other is provided. This multi-layer web of material in the region of the compensation means in particular makes a radial expansion of the weld seams between the filter walls and the securing element possible. Moreover, by means of the multi-layer web of material, the hot filter pockets are insulated from the outside, which makes for better and above all more-effective regeneration of the particle filter, as well as a cooler temperature of the housing ~~from the outside~~. Moreover, the filter pockets can be secured to the housing, via the multi-layer web of material of the compensation means, in such a way that mechanical vibrations or impact stresses that occur during operation are cushioned and the weld seams are no longer so greatly threatened with fracture from mechanical stresses.

Page 7, please replace paragraph [0020] with the following amended paragraph:

[0020] ~~Finally, it~~ It is also proposed that at least one inward-curved bead is embodied at least in some regions in the circumferential direction on a radially inward-located folded web portion of the web of material. Preferably, the beads extend over the entire circumference of the inner web portion of the web of material, so that the filter pockets of the filter body can be braced in a way oriented radially inward.

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Please replace paragraph [0021] with the following amended paragraph:

[0021] Finally, it is proposed that the filter walls include a sintered ~~material~~ metal. Filter walls of a sintered material can be secured, preferably welded or soldered, to the securing element by their axial end faces.

Please replace paragraph [0022] with the following amended paragraph:

[0022] Drawings **BRIEF DESCRIPTION OF THE DRAWINGS**

Please replace paragraph [0023] with the following amended paragraph:

[0023] Further characteristics, possible applications, and advantages of the invention will become apparent from the ensuing description of exemplary embodiments of the invention, taken in conjunction with which are shown in the drawings, in which: [.] All the characteristics described or shown, on their own or in arbitrary combination, form the subject of the invention, regardless of how they are summarized in the claims or the claims dependencies and regardless of their wording in the description and their illustration in the drawings. Shown are:

Please replace paragraph [0024] with the following amended paragraph:

[0024] Fig. 1[.] is a particle filter according to the invention, in a first preferred embodiment, in a perspective sectional view;

Please replace paragraph [0025] with the following amended paragraph:

[0025] Fig. 2[.] is an exploded perspective view of a particle filter known from the prior art[.] in a perspective view;

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Page 9, please replace paragraph [0035] with the following amended paragraph:

[0035] Fig. 12, a detail of a securing element of the particle filter of the invention, in a tenth preferred embodiment; and

Please replace paragraph [0037] with the following amended paragraph:

[0037] Description of the Exemplary Embodiments

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Page 10, please replace paragraph [0040] with the following amended paragraph:

[0040] The filter walls 5 include a sintered metal. For the production of the filter walls 5, metal fibers or grains are sintered together with a metal substrate mat. As exhaust gas from a diesel engine flows through the particle filter 1, soot particles are deposited onto the surface of the filter walls or plates 5. From time to time, the particle filter must be freed of the soot particles, in what is called a regeneration phase. To that end, the particle filter 1 is heated to a very high temperature, in the range of over 550°C, so that the soot particles will burn off in a way that is as much as possible free of residue. In the regeneration, the filter walls 5 heat up to a greater extent than the outer flange 6a and the inner flange 6b. Since the outer flange 6a is secured to the housing 2, the major thermal expansion of the filter walls 5 and of the regions 6c of the securing element 6 that are joined to the face ends of the filter walls 5 causes can cause severe stresses in the weld seams between the filter walls 5 and the regions 6c of the securing element 6.

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Page 11, please replace paragraph [0041] with the following amended paragraph:

[0041] A remedy to this can be provided by the particle filter 11 of the invention, of the kind shown for instance in Fig. 1. In the particle filter 11 of the invention, the individual components have been designated by the same reference numerals as in Fig. 2, but increased by ten in each case. The particle filter 11 of the invention is shown in only fragmentary form in Fig. 1. For the sake of simplicity, the filter walls 15 in particular are not shown in Fig. 1. However, the securing element 16 embodied in a special way can be seen, with the outer flange 16a, the inner flange 16b, and the regions 16c that are welded to the face ends of the filter walls 15. Compensation means 17 are integrated into the securing element 16 of the particle filter 11 of the invention, and by means of them a motion of the regions 16c of the securing element 16 that are welded to the filter walls 15, caused for instance by temperature changes, can be compensated for. Since in the particle filter 11 of the invention, the regions 16c of the securing element 16 are movable freely with the filter walls 15, stresses and resultant stress fractures of the weld seams can be effectively prevented.

Page 15, please replace paragraph [0052] with the following amended paragraph:

[0052] It is a common feature of all the exemplary embodiments of the particle filter 11 of the invention that the regions 16c of the securing element 16 that are welded to the face ends of the filter walls 15 are movable, and that compensation means 17 are provided which prevent motions of the filter walls 15 and/or of the regions 16c from being able to lead to excessive stresses and consequently stress fractures of the weld seams between the filter walls

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15 and the regions 16c. This can be attained by means of arbitrarily embodied compensation means 17 and/or arbitrarily located compensation means 17.

Please replace paragraph [0053] with the following amended paragraph:

[0053] In a further exemplary embodiment, shown in Fig. 13, the compensation means 17, which in Fig. 4 are subdivided into the portions 17a and 17b, can be limited to a single part, one compensation element 27, thereby saving both material and creative molding steps for the compensation means 17, and a lesser radial length of the entire arrangement compared to the ~~housing 3~~ filter body 2 can be attained.

Please add the following new paragraph after paragraph [0054]:

[0055] The foregoing relates to preferred exemplary embodiment of the invention, it being understood that other variants and embodiments thereof are possible within the spirit and scope of the invention, the latter being defined by the appended claims.